

means for receiving said reflected point source image and for converting said point source image to corresponding digital signals;

a digital data processor for calculating wave aberrations of the eye so as to include at least third order modes, using said digital signals; and

means connected to receive the calculated wave aberrations from said digital data processor for performing surgery of said living eye.

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27. A method for performing surgery to correct for at least the third order wave aberrations of the living eye, comprising the steps of:

generating a reflected point source image of the retina of said living eye;

receiving said reflected point source image and converting said point source image to corresponding digital signals;

calculating wave aberrations of said eye so as to include at least third order modes, using said digital signals; and

receiving the calculated wave aberrations for use in performing surgery to provide wavefront compensation for said at least third order wave aberrations of said living eye.

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28. Apparatus for use in performing surgery on the retina of the living eye, said apparatus comprising:

a plurality of lenslets which form a lenslet array for receiving a reflected point source image of said retina and for creating an aerial image of the retinal point source;

a camera located adjacent to said lenslet array for viewing said aerial image of the retinal point source formed on each of said plurality of lenslets of said lenslet array;

a digital data processor connected to receive video output signals from said camera and for converting said video output signals to digital signals representative of said retinal point source aerial images, said digital data processor further calculating wave aberrations of said eye, using said representative digital signals; and

surgical equipment connected to receive said calculated wave aberrations from said digital data processor for use in performing surgery on the retina of said living eye.

29. A method for performing surgery on the retina of the living eye, comprising the steps of:

forming a lenslet array for receiving a reflected point source image of said retina and for creating an aerial image of the retinal point source;

viewing said aerial image of the retinal point source formed on said lenslet array using a camera which produces video output signals;

receiving said video output signals from said camera and converting said video output signals to digital signals representative of said retinal point source aerial images;

calculating wave aberrations of said eye, using said representative digital signals; and
using said calculated wave aberrations of said eye in performing surgery on the retina of said living eye.

Remarks

By the instant amendment, four new independent claims have been added and the originally filed independent claim 1 has been canceled. Thus, four claims are contained in this application for consideration.